# Unilateral feather fragility in a wild Shelduck

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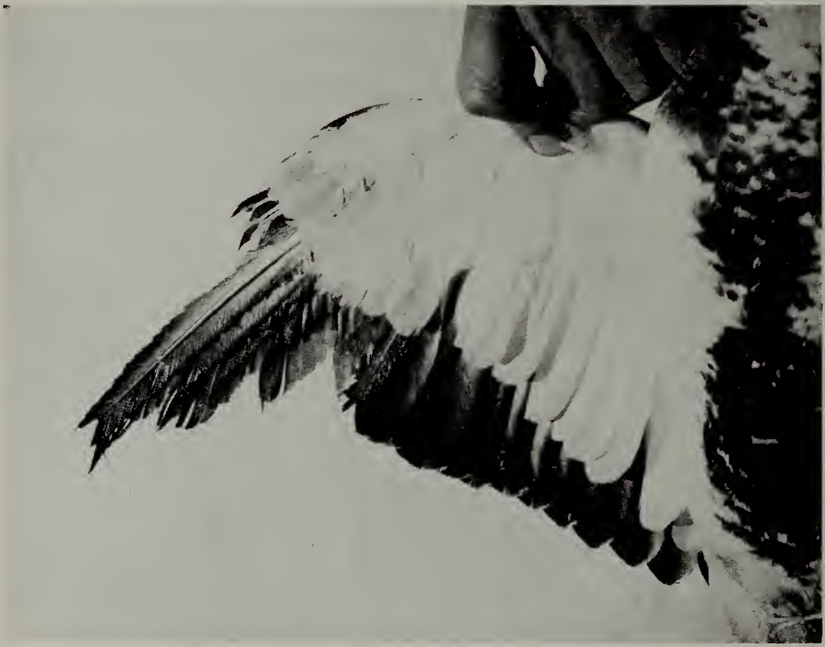
On 12th May, 1965, a pair of Shelduck *Tadorna tadorna* (Linnaeus) was collected in North Kent. The duck, which was flying strongly was found to have the first eight primaries of its right wing (fig.) affected by what would appear to be a state of feather fragility. As can be seen the fracture line is irregular.

This condition in this species was first recorded in 1958 (Harrison, J. M., and J. G.) in the remains of a specimen found roughly in the same area. It is believed to be a pathological state and possibly of genetic origin, though at present very little is actually known about it.

It has been met with in various species in widely divergent genera, notably in the Jay, *Garrulus glandarius* (Linnaeus) in which species group it has occurred in the British race *G.g. rufitergum* (Hartert) (1931; 1960) as well as in the Asiatic Black-capped Jay, *G.g. atricapillus* Geoffroy St. Hilaire, in Israel (1960).

It is perhaps not without significance that in this species the writer has also recorded an instance of the condition of "hairy albescence" in an



Right wing of adult duck Shelduck, showing condition of feather fragility.

example of the nominate race from Switzerland (1923). This is a genetically determined condition in which albescence is linked with a defect of feather structure, in which the interlocking mechanism of barbs and barbules is lacking; a similar state has been recorded in the Waterhen, *Gallinula chloropus* (Linnaeus).

The bird fanciers have taken advantage of this plumage abnormality in other genera, and have by selective breeding, produced the so-called "frizzled" varieties of the domestic fowl and canary; in the domestic fowl this variety is referred to as "silky".

As has already been mentioned, the causes of feather fragility are at present unknown, but the cases just mentioned in which alteration in feather structure in association with albescence strongly suggest that the state may in effect be genetic.

Ash (1960), however, in a very exhaustive study has disproved my earlier suggestion in so far as the effects of ectoparasites are concerned.

It may be suggested that the condition could be occasioned by dietary deficiencies. This one can well understand might be the case in birds in captivity, but the writer is very sceptical that this could be operative in wild birds. Ash (*loc. cit.*) indeed gives direct evidence that an unbalanced diet can occasion deterioration of feather development, though this, of course, is not precisely the same condition. That this can occur is of course in no way surprising, and one can call to mind analogous conditions in other vertebrates due to such causes.

Ash comments" The present author had a Carrion Crow in his possession taken at about three weeks old from a brood of apparently perfectly healthy wild birds. This bird had a few *Menacanthus* sp. on it when taken. It was then reared on a diet which was probably extremely unbalanced and contained a great excess of protein. This resulted in the feathers growing very weakly and twisted, and after a few weeks *Menacanthus* swarmed over the whole of the bird, feathers fell out at the slightest touch and the bird remained completely flightless."

The above account describes admirably a state of affairs brought about by a systemic and artificial cause. The generalised nature of this is, of course, in sharp contrast to the localised nature of the condition in the present instance, for this bird was observed by the writer to be flying about strongly and in no way different to any of the other Shelducks seen at the time; it was certainly not suspected of being the subject of this curious condition until handled.

These cases could still conceivably be considered to relate to a systemic cause acting selectively upon the long flight feathers as previous cases have been symmetrical.

Another very curious feature is the fact that the condition has been found in such divergent genera as *Garrulus* and *Tadorna*, and now to add further difficulties to a proper understanding of the condition is the fact that it is now recorded in a wild shot adult female of the Shelduck as a unilateral condition, for the corresponding feathers in the left wing were normal.

What would appear to be the extreme of this condition was recorded in a Mallard, *Anas platyrhynchos platyrhynchos* Linnaeus (Harrison, James and Harrison, Jeffery, 1965). In this bird all the integumentary structures besides the feathers were affected, the scales of the legs and feet were affected, the webs of the paddles were missing, while even the thaeca of the bill was scaling off. Both eyes were affected, one of which had perforated.

At first it was thought that the bird had come into contact with some farm chemical but special tests disproved that this was the case, nor was any internal pathology disclosed.

Conditions such as these are bound to excite interest, and a natural first question is, of course, the cause. Undoubtedly the most popular guess would be diet. However, as diet is assimilable and must therefore be regarded as a systemic agent, it is not easy to accept this as causing a unilateral condition. Not of course that this is unknown for one can think of some of the systemic infections in man which give rise not only at their onset to generalised effects but also, in some cases, to unilateral effects at a later stage, some of which remain as permanent damage. So that one cannot positively assert that all unilateral states are necessarily genetic in origin, and all one can say on this issue is that there are more unilateral conditions that are genetic in origin than symmetrically disposed states.

Some general considerations are forced upon us at this stage, just as they have been in the past in considering parallel conditions in the human.

In man a proneness, or susceptibility to certain diseases has been recognised from as long ago as the last century, possibly even earlier. In medical literature the terms "diathesis", "susceptibility" and "constitution" are constantly recurring, one speaks of a tubercular or gouty diathesis, indicating of course an individual *prone* to such disease.

All these terms and some others are used to indicate a proneness to deviate from the state of "well-being" to that of "ill-being". That is to say that a body is in a state of "well-being" when intrinsically its functional physiology is normal and balanced. If such is not the case then deviations from average normal standards occur. These can be occasioned by intrinsic inadequacies – genetic hereditary defects rendering the subject liable to develop the state of "ill-being", or by *extrinsic agents* such as disease toxins, and other extraneous influences.

Medical literature again uses such terms as "in-born errors of metabolism" (Garrod, 1923) and familiar conditions due to such states are of course gout and diabetes.

These two conditions exemplify the combined actions of the intrinsic and extrinsic factors acting in concert. This state of affairs has been aptly described by Rolleston (1927) as "an unusual personal equation". "Idiosyncrasy" (Garrod, 1931) is also covered by the above definition. Ride (1938) has postulated "a transmissible variation in structure or function (or both, J. M. H.) of tissues rendering them peculiarly liable to react in a certain way to certain extrinsic stimuli". If we reflect upon these cases of feather fragility in the above contexts, what is at the moment quite inexplicable, becomes perhaps a little less obscure.

It is certain that there is no simple answer and that there are in all probability, as indicated above, intrinsic as well as extrinsic influences at work.

That this concept is probable would seem to be supported by the fact that the condition is widespread both geographically and genetically; furthermore I personally cannot accept a theory that wild creatures are incapable of seeking out a dietary suited to their requirements.

If it is accepted then that these cases suffer from some inborn and inherent predisposition, then environmental stresses, *i.e.* the necessity for flight for survival on pinions that are unable to take the stress, can operate to produce the curious condition shown by these birds, thus providing an admirable instance of Ride's dictum quoted above, of an inherited proneness to a state of "ill-being" which can be expressed functionally or morphologically, or in both ways.

Further studies in all such cases are desirable, including, if an opportunity presents, breeding experiments, with a view to seeing whether or not the condition is transmissible. The subjects examined in the flesh by the author have all been in excellent physical condition apart from the abnormality of the flight feathers and in some cases, of the tail feathers. The case of the Mallard recorded above provides an exception and shows that the condition, if genetic, can be morbific or even amount to a lethal state.

## *Summary*

A case of unilateral feather fragility in a wild adult female Shelduck is described. A possible explanation based on the effects of intrinsic and extrinsic factors in combination is advanced.

## *Acknowledgements*

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